Available online at www.sciencedirect.com
SCIENCE DIRECT®
ELSEVIER
Nuclear Instruments and Methods in Physics Research B 221 (2004) xv–xvii
NIM B
Beam Interactions with Materials & Atoms
www.elsevier.com/locate/nimb

Contents

Editorial vii
Committees and Sponsors viii
Photos ix
List of participants x
Contents xv

1. Antihydrogen and CPT tests

Collisions between low-energy antihydrogen and atoms
E.A.G. Armour, C.W. Chamberlain, Y. Liu and G.D.R. Martin 1
Lorentz and CPT tests in matter and antimatter
R. Bluhm 6
Antiatom–atom scattering with the close-coupling model
S. Chakraborty, A. Basu, P. Chaudhuri, P.K. Sinha and A.S. Ghosh 12

2. Collisions between positrons and atoms/molecules

Positron impact ionization of molecular nitrogen
R.I. Campeanu, V. Chis, L. Nagy and A.D. Stauffer 21
Computing vibrational effects in low-energy positron scattering from polyatomic molecules: the H_2O and C_2H_2 stretching modes
T. Nishimura and F.A. Gianturco 24
The role of vibrational doorway states in positron annihilation with large molecules
G.F. Gribakin and P.M.W. Gill 30
P-wave resonances in positron–lithium scattering
U. Roy and Y.K. Ho 36
Investigations of positronium formation in positron collisions with atoms having zero threshold energy
J.W. Humberston and P. Van Reeth 41
Positron scattering by molecules
W.E. Kauppila, T.S. Stein, E.G. Miller and E. Surdutovich 48
Differential ionization experiments on positron–atom scattering
Á. Kövér, C. Arcidiacono and G. Laricchia 56
Positronium induced collisions
G. Laricchia, S. Armitage and D.E. Leslie 60
Positron impact electronic excitation of N_2
P. Chaudhuri, M.T. do N. Varella, C.R.C. de Carvalho and M.A.P. Lima 69
Total cross sections for electron and positron scattering from 4-fluorobenzaldehyde ($C_6H_4(CHO)F$) molecules
C. Makochekanwa, O. Sueoka and M. Kimura 76

doi:10.1016/S0168-583X(04)00694-9

Experimental studies of the interaction of low energy positrons with atoms and molecules
J.P. Marler, L.D. Barnes, S.J. Gilbert, J.P. Sullivan, J.A. Young and C.M. Surko 84
Excitation of fine-structure states of krypton and xenon by positron impact
A.D. Stauffer, L.A. Parcell and R.P. McEachran 93
Measurements of cross-sections for positrons and electrons scattered by Cs atoms
E. Surdutovich, W.E. Kauppila, C.K. Kwan, E.G. Miller, S.P. Parikh, K.A. Price and T.S. Stein. 97
Investigation into the energy dependence of the annihilation cross-sections for Ne and Xe below the positronium formation threshold
M. Szłuińska and G. Laricchia 100

3. Positronium interactions and scattering

Positronium formation from Ar and Xe
M. Szłuińska and G. Laricchia 107
Scattering of positronium atoms
S. Chakraborty, A. Basu and A.S. Ghosh 112
Studies of low energy positronium-gas scattering using age-momentum correlation
J. Engbrecht 119
Electron/positron collisions with positronium
S. Gilmore, J.E. Blackwood and H.R.J. Walters. 124
Positronium formation in positron–noble gas collisions
S. Gilmore, J.E. Blackwood and H.R.J. Walters. 129
Experimental investigation of ortho-positronium–surface interactions
T.S. Stein, W.E. Kauppila, E.G. Miller and E. Surdutovich. 134
Low energy positronium–hydrogen scattering
P. Van Reeth and J.W. Humberston 140
Many positron and positronium interactions
H. Yabu 144
Positronium–atom collisions
H.R.J. Walters, A.C.H. Yu, S. Sahoo and S. Gilmore. 149

4. Positron facilities

The neutron induced positron source at Munich – NEPOMUC
C. Hugenschmidt, G. Kögel, R. Repper, K. Schreckenbach, P. Sperr, B. Straßer and W. Triftshäuser. . 160
A ^{22}Na positron source for use in UHV
R. Krause-Rehberg, N. van der Walt, L. Büttner and F. Börner 165
LEPTA project: generation and study of positronium in directed fluxes
I.N. Meshkov 168

5. Ps and Ps^-

Positronium in laser fields
L.B. Madsen 174
Symmetries and states of Ps_2
D.M. Schrader. 182
Towards a new measurement of the decay rate of the negative positronium ion Ps^-
D. Schwalm, F. Fleischer, M. Lestinsky, K. Degreif, G. Gwinner, V. Liechtenstein, F. Plenge and H. Scheit. 185

Stochastic variational approach to resonances of Ps^- and Ps_2
Y. Suzuki and J. Usukura 195
Perspectives for pulsed positrons
P. Balling, D. Fregenal, T. Ichioka, H. Knudsen, H.-P.E. Kristiansen, J. Merrison and U.I. Uggerhøj . 200
Effect of the core polarization term on Ps formation in low-energy e^+–Li collisions
S.J. Ward and J. Shertzer 206

6. Antiparticle therapy

Biological effectiveness of antiproton annihilation
M.H. Holzscheiter, N. Agazaryan, N. Bassler, G. Beyer, J.J. DeMarco, M. Doser, T. Ichioka, K.S. Iwamoto, H.V. Knudsen, R. Landua, C. Maggiore, W.H. McBride, S.P. Møller, J. Petersen, J.B. Smathers, L.D. Skarsgard, T.D. Solberg, U.I. Uggerhøj, H.R. Withers, S. Vranjes, M. Wong and B.G. Wouters 210

7. Positrons in the Universe

Positrons in the Universe
J. Paul 215

8. Positrons in solids

Study of microstructural defects in steel using positron annihilation lifetime technique
E.E. Abdel-Hady 225
Delocalized positronium as a tool for investigation of second-order structural phase transitions in crystalline dielectrics
I.V. Bondarev 230
Energy loss rate and thermalization of subionizing positrons and electrons
S.V. Stepanov and V.M. Byakov 235

Author index 239